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## GROUP THEORY.

In view of the interest that is being taken in America in the Theories of Finite and Continuous Groups as well as in their various applications it is thought desirable to have a special department in THE AMERICAN MATHEMATICAL MONTHLY devoted to problems in this field. The receipt of letters from a number of our contributors suggesting this innovation leads us to hope it will be a successful one. THE EDITORS.

1. Proposed on p. 21 as Miscellaneous and solved on p. 98, as Group Theory No. 1.

2. Proposed by W. BURNSIDE, The Croft, Bromley Road, Catford, England.

Show that the group of the biquadratic equation $x^4+2ax^2+b=0$, in which $a$ and $b$ are rational numbers, while $a^2-b$ is not the square of a rational number, is in general a dihedron group of order 8; but that (*i*) if $b$ is the square of a rational number the group is a non-cyclical Abelian group of order 4; and (*ii*) if $b=a^2\div(1+n^2)$, where $n$ is a rational number, the group is a cyclical group of order 4.

3. Proposed by L. E. DICKSON, Ph. D., The University of Chicago

Show that the equation $x^4-ax^3+bx^2-ax+1=0$, in which $a$ and $b$ are rational numbers, while neither $2-b+(\frac{1}{2}a)^2$ nor $(1+\frac{1}{2}b)^2-a^2$ is the square of a rational number, is irreducible in the domain $R$ of rational numbers; determine its group for this domain.

## NOTES.

Editor Dickson has been granted leave of absence for six months from the University of Chicago to accept the appointment of Research Assistant to the Carnegie Institution. Dr. Dickson's investigation will relate to the application of Group Theory to certain problems in Geometry and Function Theory. F.

*School Mathematics* announces the following list of associate editors: Robert J. Aley, University of Indiana; Joseph V. Collins, State Normal School at Stevens Point, Wis.; Clarence E. Comstock, Bradley Polytechnic Institute; Ellery W. Davis, University of Nebraska; David Felmley, State Normal School, Normal, Ill.; J. E. Gould, University of Washington; Franklin Turner Jones, University School, Cleveland, O.; G. A. Miller, Stanford University; W. F. Moncrief, Winthrop College; E. H. Moore, University of Chicago; Frank Morley, Johns Hopkins University; Charles W. Newhall, Shattuck School, Faribault, Minn.; H. B. Newson, University of Kansas; John C. Packard, High School, Brookline, Mass.; Arthur Schultze, New York High School of Commerce; Monroe B. Snyder, Central High School, Philadelphia; David Eugene Smith, Teachers College, Columbia University.